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THOUGHT REVEALED AS A FEELING PROCESS IN INTROSPECTION

WHAT is here attempted to establish is:

1. That the whole of what we are in the habit of considering as intellectual operations may be revealed in introspection as feeling process only. But to make this appear, we have to advance the theory that what in these operations are usually termed images are in ultimate analysis but specialized feelings having the characteristic of *prominence* in contrast to the characteristic of agreeableness and unagreeableness as composing emotional feelings.

2. That every intellectual operation may reveal itself in introspection as wholly consisting of *manipulations* of emotional states and *specialized* feelings.

3. That in all thought which is not directly influenced by what are usually termed sense effects, the emotional states in introspection appear as the primary factors therein, as determining the character of the process and effecting the revival and subsidence of the whole imagery phenomena.

In introspection it would seem that the greatest difficulty is experienced in *catching* the whole process in its ultimate phases, as it is in most cases interfered with by the more complex thought constructions. The intellectual operations which take place in the invention of mechanical contrivances seem to give the best results: for here the manipulation consists mainly of *concrete* images and emotional states.

The best case of this kind which occurred to the writer is given below. In this experience every phase of the process was noted at the time and conjointly with the *constructed thoughts* involved in the inventive process, so that the observing of the ultimate phases in this occurrence was no more *retrospective* than the *constructed* intellectual phenomena involved.

When a young man, there once flashed on the writer's mind a strong desire to invent a flying-machine. There then immediately

followed, without further stimulus or any previous knowledge of what had been accomplished in this direction, the following somewhat complex intellectual operation: There came first into prominence the impression of a bird in flight, with the wings most distinct, the body always remaining so blurred that at no part of the operation did the thought of a particular name for the total impression—bird—come into prominence. But a series of rapid changes of the wings was very manifest. It was as if a real bird were rapidly changing its position so that one could obtain a view of the wings from all the varying positions of the body. In fact, the whole intellectual performance was as if it were a real performance, only the changes seemed much more rapid than could have taken place in reality. There existed all through a sense of alertness and a slight sense of strain, similar to what one may have in watching an interesting operation to see how it will come out. These changes seemed to last just long enough to bring a characteristic, something of value, *i. e.*, a *presentation with an agreeable feeling accompaniment,* into prominence; and the time element in each seemed to vary in a peculiar way, *i. e.*, with the importance of the presentation for furnishing appropriate, satisfying characteristics. The subject remembers distinctly the rise of agreeable feeling when the variation in the *time* of the change was first experienced or felt.

Emotional activity was here manifest, which seemed to blend in a most peculiar way with every intellectual presentation which came into consciousness. *This blending or osculation seemed to effect the rise and subsidence of the intellectual presentations.*

The longer duration of the blending process seemed to constitute a value, a registratory value, in a later summary of all the agreeable encounters, while all the intellectual presentations met by unagreeable feeling seemed to be lost with reference to any future value. This will be made more clear when we come to the *constructive* part of the process. All through this part of the process there existed a permanent and slightly unagreeable feeling above the varying feelings continually osculating or blending with the incoming intellectual presentations, and which seemed to be the stimulus to this incoming. This seemed to be the stimulus which makes one assert, 'I want to see the *ins* and *outs* of this process.' But so far from there being any assertion here, as is sometimes considered necessary to all thinking processes, we can positively assert that there was no thought of a word as such, no presentation of a linguistic sign during the whole procedure. It was an intellectual process *recording itself,* unaccompanied by any superfluities. The whole intellectual phenomena seemed to be brought into existence by, and to be obedient to, the

varying emotional states. And when the unagreeable state gave place to a sense of easement, or more agreeable feelings, the state was such that, if it had compelled expression, the expression would have been as, 'I have made a discovery,'— and the feeling of the former uneasiness might be conveyed by the expression, 'I want to terminate this state for one of a more quiet or agreeable nature.' And yet this unagreeable, undesirable feeling seemed, from the prompt way in which the intellectual phenomena would come into prominence and join with the feelings, to be absolutely necessary for the continuance of the operation. For the cessation of unagreeable and the rise of agreeable feeling seemed to effect the subsidence of the intellectual presentations. There were other effects involved in these operations. While the wings were *displaying* themselves, there was a vague sense of the resistance and yielding of the atmosphere under the strokes of the wings. After these manipulations had continued for some time, there seemed to persist a summation of the values, *i. e.*, a complete conception of the wings' movements, their shape, the angular position in the upward and downward strokes, and the conception of the *work* that might, by these particular movements, be accomplished, seemed to come into prominence. There seemed to come out, as the work accomplished, a vague pictorial representation of a bird pushing itself up an inclined plane, which plane was continually yielding, so that the actual line of travel seemed to be more or less straight. The whole phenomena seemed to consist of these manipulations of the feelings with the intellectual presentations; and of the intellectual presentations, those only seemed to persist as having value—more permanent registration—which were embraced by or blended with the agreeable feelings; and the total resultant feeling, if the subject had at the time attempted to give it expression, might have been expressed as, 'I have picked out what was useful from this miscellaneous collection,' and, at a still more advanced stage in the summation of these feelings, as, 'I have now a complete conception of how flight is accomplished by birds.' But no articulation and no muscular movements, as such, formed any part of the phenomena we are here attempting to describe.

Another peculiarity seemed to arise, in the fact of an increase in the agreeable feeling—the rise in the subject's interest—as the peculiarities of the phenomena came into prominence, *e. g.*, the rapid inhibition of intellectual presentations which seemed to possess slight value in the summation, and the lingering, the longer duration, of those presentations which seemed to have a greater value. This seemed to be characterized by variations in emotional states. The whole feeling might be described as the satisfaction arising from the

complete discovery of the phenomena. We have said that the general feeling throughout the operation seemed more or less unagreeable, irritating, thus acting as a stimulus to further intellectual activity. This irritation being now present seemed to bring into existence representations of mechanical contrivances, but these were at first of so vague a nature that no permanent registration of them occurred; instead, the feeling of irritation, unagreeableness, was enhanced, which increased to a strain, and a momentary deadlock seemed to exist. Then in a flash the *bird's* wing was obliterated, and a bat's wing suddenly presented itself. And with the same rapidity did the feeling change; the former unagreeable strain on this point now gave place to a feeling of easement; that change of feeling which might make one exclaim, 'That's more like it; I must have been on the wrong track before.'

But there soon arose again the feeling of irritation, incompleteness, followed by the appearance of changing intellectual phenomena. First the skin covering of the bat's wing came into prominence, and almost immediately a substitution in the way of a silk fabric arose, and with this the feeling of agreeableness—easement—was distinctly discerned, and with it the cessation of any further selective movement in this particular direction. But on the rise of further irritation, *i. e.*, unagreeable, unsatisfactory feeling, there occurred a change in the presented phenomena, although no decided intellectual activities were at first very clear. There was a decided feeling of strain, a feeling of something wanting,—an emptiness seemed to persist for a moment. The subject's previous experience had given out; he possessed no definite knowledge of the anatomical structure of a bat's wing. But means were at hand whereby the desired information was soon obtained, and the mental manipulation started up again into new life, bringing first the skeleton of the bat's wing into prominence, and before this presentation had completely faded there arose, as if in a side view, the rapid presentation in various forms of the more common metals used in the arts. This stage of the operation seemed particularly interesting. It seemed as if the subject was actually passing through more or less of his whole former experience of the nature and manipulation of metals. The skeleton framework seemed never to wholly disappear during this part of the operation, —or was so readily revived as to give that impression,—so that the requirements in a substitute for an artificial wing, such as lightness, strength, elasticity, etc., seemed to impress themselves more readily by imaginary experiments continuously made on the pictured framework; and these effects seemed to have their influence on the incoming effects, as will soon be manifest.

There did not seem to be any particular order in the presentation

of the various metals, but the time they would stay in prominence seemed to have a specific relation to their prospective utility for the purpose under consideration. For instance, when a soft metal came into prominence, which it did, it was obliterated with such rapidity as to require the greatest alertness to feel sure that it had been presented. This assurance was psychically manifest as the heightening of the agreeable feeling. This process went rapidly on until steel presented itself in a variety of forms, and here there seemed to be a more hesitating movement as the feelings seemed to *warm* up to it. And a variety of modifications, such as round, square and hollow bars, came into prominence. Then various manipulations with tempered and untempered steel took place. The whole phenomena seemed like a complex operation which might have taken place in actual practise somewhat as follows: having discovered that I require a material, light, strong, elastic and durable, I set to work experimenting with the various metals, quickly discarding every metal which comes before me, with the exception of steel. Here my procedure is more careful. I temper it; I try to break it; I also try steel of various sections, and tube steel, but none as yet seems to answer my requirement exactly. Now if we substitute for what is here assumed to be accomplished physically by manipulation and what we think of as judgment, the interaction of intellectual phenomena with the characteristics of the primary feelings which we have here termed agreeable and unagreeable, we may get a fairly accurate psychical representation of the phenomena under consideration. The intellectual phenomena, so called, apart from the feelings, seem to have a *value* only in their *prominence.* And this characteristic is, as we have seen, stimulated into existence by the emotional states.

To resume. We arrived at a point where there was as yet no definite outcome as a result of the manipulations of the metals. There was again a slight hesitancy and strain; then suddenly the appearance of steel of a U section presented itself, and just as rapidly did the agreeable state seem to rise and *spread over,* as it were, the intellectual effect, bringing about a sort of agreeable quiescence, and seemingly inhibiting further activity in this particular manipulation. But this process seemed tantamount to the registration of a value in the whole. The subject remembered afterwards what seemed to him as the cause of this particular termination. He had previously been informed that steel with a U section, when properly tempered, was difficult to rupture, while being elastic; and when bent to a curved form before tempering, was difficult to turn inside out; it being, at the same time, comparatively light and strong, which is the reason for its use in the frames of

umbrellas. Now these, as we may see, are characteristics which might be useful in the mechanical construction of wings, and so required to bring about harmony in some way in this psychical process. We have mentioned that the skeleton wing seemed not wholly to disappear, or to become so easily revived as to give the appearance of continued presentation. This phenomenon still persisted, although there now commenced a further intellectual manipulation of a somewhat changed nature, seemingly in response to a still persistent feeling of unagreeableness or incompleteness. Structural arrangements began to form themselves, following out somewhat closely the presented structure of the skeleton bat's wing. For instance, plates of metal suitable for the attachment of appropriate joints—double eyes—for the long fingers presented themselves as substitutes for the wrists. To these on the one side were connected the four digits, and to the opposite side the forearm appeared as jointed, and the whole structure soon built itself up in imagination very similar to the way we might suppose a person going to work in actual practise, only much more rapidly,—with a model to guide him close at hand. As can be readily seen, having observed the structure of a bat's wing, it could be imitated mechanically with little difficulty: there arose the imaginary trial and rejection. Then again an agreeable feeling would arise with some definite presentation, this being the psychical state for completion by its seeming to effect a registration of this particular effect. Then another part would be presented and a similar process gone through. There was some slowing down of the process when the articulation at the shoulder was approached, but finally there arose certain presentations of ball-and-socket joints which were immediately succeeded by agreeable feelings, and the operation ceased.

Then from this *built-up thought* models were constructed, and as these were approaching completion their complex nature began to manifest itself. This may psychically be called the rise of unagreeable feeling on the presentation of the created intellectual complex. While nature had been fairly well followed here, the discontented feeling which sometimes arises when one has done too much was very manifest. It was becoming apparent for the first time that the complication of folding the wings was unnecessary to flight. The feeling of strain and uneasiness seemed again to persist for a brief period, when all of a sudden the appearance of an insect's wings came into prominence, and the former irritation was as suddenly changed for a feeling of agreeable quiescence. The remainder of this psychical process seemed to proceed now with less effort, and after various combinations taking place under influences similar to

those already described, there arose the appearance of a compromise between a bird's wing and an insect's wing; and with this appearance the whole activity seemed to subside and the psychical-complex, the psychosis, now regained its normal state. There seemed now no incentive to stir it further.

Models were constructed from designs conceived in these latter activities, and although thirty-five years have since elapsed the writer has never been able to improve upon these designs.

E. A. NORRIS.

ALBANY, N. Y.

MEMORY TYPES OF COLORADO PUPILS

IN connection with the work in educational psychology and child study in the Colorado State Normal School during the past year, studies have been made of the memory types and memory spans of both normal school and training school pupils, the results of which, while revealing nothing wholly new, may be valuable for purposes of comparison or as hints for further investigations. The subjects of the investigation were 100 boys and 154 girls of the training school, distributed through the grades from three to eleven, inclusive, and some 300 juniors, mostly girls, in the normal school.

I. *The Tests.* The tests were those used by Smedley,[1] with some modifications, which are apparent in the descriptions. Five sets of ten cards each were prepared, one set for each test. The cards were of dark gray cardboard, 3.5 inches wide by 18 inches long. On each card a number was printed in white digits 2.5 inches high and 2 inches wide, the numbers ranging from four digits to eight digits, and two numbers of each length constituting one set of test cards. In the arrangement of the nine significant digits to form the numbers, care was taken to avoid familiar sequences, thus minimizing the number of natural associations among the digits. The object was to discover what differences, if any, existed in the students' ability to remember combinations of digits when the stimulus was purely auditory, purely visual, or audio-visual, audio-visual-articulatory and audio-visual-articulatory-hand-motor—to use Smedley's terms.

II. *The Method.* A different set of cards was used for each test. To regulate the rate of reading the digits in the auditory test and to determine the length of exposure of the card in the other tests, a metronome beating 72 times per minute was used. One beat was allowed for each digit in the number exposed, and five seconds

[1] See the Chicago report, No. 3, of the Department of Child Study and Pedagogic Investigation, 1900–1901, pp. 43–60.

elapsed between the end of the exposure and the writing of the number from memory. In the auditory test the number was read aloud distinctly and without rhythm to the beating of the metronome. In the visual test the card was exposed in easy view of the pupils for a period determined by the length of the number—five sixths of a second for each digit. In the audio-visual test the number was read aloud while the pupils were regarding it, the rate of reading and length of exposure being determined as in the first two tests. For the audio-visual-articulatory experiment the pupils read the number on the exposed card aloud and in concert. Our final test of the five differed from Smedley's in that we included in the stimulus the articulatory element which he omitted: he had his subjects write down the numbers from dictation, and later reproduce them; our subjects read the numbers from the exposed cards in concert, as in the articulatory test, and at the same time wrote them with the blunt ends of their pencils.

Since the numbers of each set of cards aggregate 60 digits, the computation of the per cent. of error was an easy matter. One error was scored for each digit misplaced, substituted, omitted or inserted.

III. *Results in the Grades.* 1. The memory span—determined as in Smedley's report (pp. 52, 53)—for auditory memory was found to be four digits for the third grade, five digits for grades four to seven, inclusive, and six digits for grades eight, nine, ten and eleven;[2] for visual memory the span is five digits in grade three, six in the next three grades and seven in the highest four grades. These averages seem slightly below those of the Chicago children of Smedley's test, though his computations were on the basis of age rather than grade.

2. This study gives no evidence of a special memory period. Every type of sense memory improves steadily through the ages covered by the investigation, although auditory memory has attained almost its maximum by the age of fifteen.

3. Auditory memory is distinctly inferior to every other type here studied, in every grade and at every age (eight to twenty-one). Its curve runs from 5 per cent. to 15 per cent. below the others. Smedley found auditory memory superior to visual until the age of nine.

4. There is very little difference in sense-memory of the other four types. While they all improve as we ascend the grades, their curves all lie within a zone which averages not more than five per cent. in width as platted on the familiar gridiron. The articulatory and hand-motor curves are slightly above the visual and audio-visual curves at most ages.

[2] The high school is organized in three grades.

5. Among the subjects of this study beyond the age of fifteen, the boys show a decided superiority to the girls in every type of memory tested. Below fifteen there is no apparent sex difference, except that girls average about 5 per cent. better than boys in audio-visual-articulatory memory throughout. In one class of 166 normal school juniors the boys graded from 3 per cent. to 9 per cent. better than the girls in every test. In another class of the same rank, numbering about 140, the boys excelled the girls in every type of memory except the articulatory and hand-motor. In both these classes, however, the proportion of boys was too small to afford a safe basis for generalization.

6. Generally speaking, the better students in each grade exhibited better ability to remember than the poorer ones, though the contrast is not nearly so marked or so constant as in Smedley's results, and there are so many individual exceptions that one is forced to question somewhat the value of the generalization. The chief superiority of the good students lies in the articulatory and the hand-motor types.

7. The most striking and decided conclusions of this study arose from a comparison of the abilities in sense memory of pupils of the same age found in different grades. Fifteen-year-old pupils were selected because they were found to be most widely distributed, ranging from the sixth to the eleventh grade. While there were but thirty-seven of these pupils, quite evenly distributed as to grades, their papers brought out a very regular but decided improvement in every form of memory, except the auditory, with school advancement. To give exact figures—auditory memory improves only 1.5 per cent. from 67.5 per cent. in the sixth grade to 69 per cent. in grade eleven; visual, from 68.5 per cent. in the sixth grade to 87 per cent. in the eleventh; audio-visual-articulatory, from 74 per cent. to 88 per cent. in the same interval; audio-visual-articulatory-hand-motor, from 69 per cent. to 95 per cent. If it were safe to generalize from such limited data, we should be forced to conclude that memory power is a matter of general mental development rather than of age, and further that articulatory and hand-motor memory are types most characteristic of the more advanced students.

IV. *Further Results from Older Subjects.* 1. For auditory memory the span of normal school juniors was found to be seven digits; for visual, eight digits.

2. The averages of a class of 166 juniors are typical of the results obtained from all the older subjects tested. They are as follows: auditory, 76.4 per cent.; visual, 84.4 per cent.; audio-visual, 90 per cent.; audio-visual-articulatory, 92.1 per cent.; audio-visual-articulatory-hand-motor, 92.9 per cent. These figures seem to indicate that for mature students that is best remembered which makes its

appeal through the greatest number of sense channels—a belief which is by no means new.

3. After all the above tests had been completed, in order to discover whether the superiority of the later-tested types of memory might be due to any extent to practise, a second auditory test was given which resulted, for the 166 juniors, in an average of 85.3 per cent.; an improvement over the first auditory test of nearly 9 per cent., but still below all other types.

4. To test the effect of repetition on memory, the last-mentioned auditory test was followed immediately by another in which the numbers were twice repeated after the first reading; this yielded an average of 92.2 per cent. A third auditory experiment was then given in which the numbers were repeated but once after the first reading; the average for this test was 90.4 per cent. The figures are self-explanatory.

WILL GRANT CHAMBERS.

COLORADO STATE NORMAL SCHOOL.

DISCUSSION

THOUGHT AND IMMEDIACY

THE point raised by Professor Bakewell in his comments on Professor Dewey's account of Immediatism[1] seems to me to be so interesting and so vital to the epistemological controversy of the day as to deserve further elucidation and discussion, even after Professor Dewey's admirable replies, with which, so far as they go, I am happy to find myself in cordial agreement.

But though Professor Dewey entirely succeeds, to my thinking, in upholding his own point of view, he does not attempt to account for the genesis of what we both consider an error, or to explain how very natural and plausible Professor Bakewell's contention is bound to appear from certain presuppositions. It seems worth while, therefore, to examine it more closely and to exhibit the underlying confusion from which it seems to arise. For so long as this confusion is allowed to persist, it is impossible to understand the plain meaning of immediatism, or to appreciate the position of Professor Dewey, against which baseless accusations of inconsistency are therefore bound to spring up.

Professor Bakewell generously disclaims, on behalf of 'the idealist' in general, what I fear can be true only of his own particular school of idealism, *viz.*, any desire to despise experience, assuring us

[1] See this JOURNAL, Vol. II., Nos. 19, 22, 25, 26.

that 'from experience he starts, to experience he ever returns,'[2] and infers that the issue between him and immediatism really hinges upon the interpretation of the 'treacherously ambiguous word' experience, and the character of its immediacy. So far there is no difficulty. But he goes on to betray the source of his prepossession against immediatism by indicating the ground for his intellectualist convictions. His conception of the relation of thought to perception differs profoundly from ours. Perception to him is permeated through and through with thought and dependent upon it in all its characters. The immediate experience, therefore, upon which we rest our case is and remains 'always a complex of the immediately perceived and the mediately conceived.'[3] It follows, of course, that 'the facts of experience are, one and all, and from first to last, tainted with mediation,' that there is no 'sheer immediacy,'[4] and that immediatism is an absurdity. Experience simply can not be construed without thought, and thought imports into it the whole array of 'categories' and necessitates a rationalistic account of them.

Now the whole of this attitude follows logically from its presupposition, and the latter has not been contested by Professor Dewey. He has contented himself with pointing out what is indeed a very important fact and one which rationalism habitually ignores, namely, that ultimately all reasoning processes are directly experienced and that hence there is an immediate side to all mediation, and that immediatism recognizes thought and its 'categories' as they occur and are known in experience. This Professor Bakewell admits,[5] but it does not and can not remove his fundamental difficulty. To clear this away we must dig deeper.

We may point out, therefore, in the first place that it is *psychologically false* to treat thought as immanent in the greater part of our perceptual experience. Only such experiences are to be regarded as 'mediate' which require to be actually thought about, and are such as to set up a mediation-process (which, of course, must itself be an immediate experience, as Professor Dewey has shown). 'But if so,' I may be asked, 'do you mean to search in perception for a pure immediacy untainted by thought, for a perceptual experience which would have been what it is if no mediation had ever occurred, if no thoughts had ever entered it? Surely you can not deny that our percepts have been made by our thoughts to an unlimited extent?'

I am not, however, searching for the impossible or denying the obvious. I am pleading only for the proper psychological descrip-

[2] Vol. II., p. 688.
[3] Vol. II., p. 688.
[4] Vol. II., p. 690.
[5] Vol. II., p. 690.

tion of present facts and the proper attention to tenses. To say that percepts *have been* made by thoughts is not to prove that they *now are* thoughts, and to deny their 'mediate' character is not to deny that they have been mediated. In the light of its history the rationalist's description of immediate experience is quite intelligible. Our perceptions would not have come to be what they are if thought had never entered them, and no factor in the immediate fails to disclose the effects of mediation to a careful scrutiny. But is not all this past history totally irrelevant to the present situation and to the descriptive purpose of the psychologist? Does not the appeal to it rest on a confusion between what *is mediate* and what *has been mediated?* How is the psychical immediacy of what is now experienced impaired by the reflection that much thought has gone to its making and that it can boast of a highly intellectual ancestry? Might it not conversely have been regarded as a slur upon the purity of thought that it was predestined in the course of nature to suffer transformation into an immediate experience? The rationalist's argument, in short, is one from past history to present value, from 'origin' to 'validity,' and claims perception for 'thought,' because it once *was* thought. And in view of the strenuous opposition which rationalism offers to genetic psychology, is there not a charming flavor of inconsistency about this mode of explaining away the present facts?

If then we dismiss the rationalistic description of the immediate as psychologically unwarranted, it must be admitted that there are many experiences which are immediate and purely perceptual, and that these form a sufficient basis for immediatism. If, in addition, we realize that the 'mediations' also are immediate as actually experienced, we shall wonder further where the ground for a rationalistic interpretation of experience is to come from.

At the same time it is not difficult to foresee that the rationalist, when he realizes the situation, will instinctively flee from the hard facts of psychology to the more fluid formulas of logic. He will truly urge that a logical evaluation of our immediate experience is indispensable, and that in such an evaluation its past history can not be ignored. But he will falsely add that such evaluation will necessarily restore the supremacy of the mediate over the immediate. This assertion, however, is merely a survival of intellectualistic prejudice. There is no logical necessity about reducing perception to thought on the score of its historical antecedents. All that the historical genesis logically requires us to do is to conceive them as connected. The connection itself may be viewed the other way round. It is just as logical, and just as easy, to conceive thought as culminating in perception, as aiming at a return into the immediate

form of cognition, in short, to conceive mediation as arising and persisting for the sake of enriching the immediate. Instead of saying that perception is made by thought, why not say thought is perception in the making?

In contending that this view of the logical connection was as valid as that of the rationalist, I was, however, greatly understating my case. For really its logical value and convenience are far greater than that of its traditional rival. For the true significance and value of our rational procedures surely lie in their power to enrich and improve direct perception, and to adjust and guide our actions. It is fortunate for us that our thoughts have this power to develop gradually into immediate perceptions, to abbreviate and finally to eliminate themselves and to be absorbed in higher functions which are easier and more serviceable. Their essential function is to promote and facilitate new responses adjusted to new situations, and the quicker and more unhesitating these responses can become the more valuable they are. In this respect, however, perception excels thought. It seems absurd, therefore, to regard thought as a 'higher' process than perception merely because it is more difficult and more expensive. The perceptual and immediate form is as such preferable, and it would indeed be a fool who would prefer the protracted progress of reasoning to the rapid insight of perception, in cases where either could lead to the right decision. But as a rule our perceptions are initially inadequate. They require to be mediated and developed by painful ratiocination, and hence arises the rationalistic prejudice in favor of the 'thought' process which so often displays a superior value.

This whole antithesis, however, is a mistake, a sinister survival from the philosophy of Plato. Perception is not as such 'irrational,' nor is thought ultimately separable from perception. Instead of abusing the senses, philosophers should learn to use them. They should open their eyes to the fact that in actual knowing the mediation of the immediate and the perfecting into immediacy of the mediate form one continuous process, which rises from the lowest levels of congenital perception through the labor of reflective analysis to the unerring insight of the master mind, but exhibits in all its phases one unbroken harmony, and is controlled throughout by the purpose of sustaining and enriching life. And then, perhaps, it will at last be recognized how prescient Aristotle was in discarding Plato's false antithesis, in conceiving νοῦς, the highest mental faculty, as immediate, in equating it with αἴσθησις and in connecting rather than dissevering them by the mediation of the λόγος.

F. C. S. SCHILLER.

CORPUS CHRISTI COLLEGE, OXFORD.

A NOTE TO PROFESSOR ANGELL

PROFESSOR ANGELL'S appreciated discussion[1] of my paper on the 'Nature of Feeling'[2] seems to call for an explanation of my position, rather than for a reply to his argument; for it is evident that I have not succeeded in making clear the main points I wished to present.

I had intended to call attention to the fact already noted by other psychologists, that the word 'feeling' is used with various diverse meanings; and to show that writers of authority are wont to employ the word to express one meaning at one time, and another meaning at another time, and this without giving proper warning to their readers, and apparently without recognition of the fact that they are guilty of inconsistency.

From this I meant to argue that the word is unfitted for use in careful psychological discussions; for the reason that even if the writer employing the term explains the meaning he attaches to it, and even if he avoids all inconsistent usages, some of his readers are almost certain to attach to the word connotations of their own preference which are utterly unwarranted.

I am surprised, therefore, to find that I have left in Professor Angell's mind the impression that I agree 'that the term *can* be saved for technical service' (p. 169); for I had intended, on the contrary, to indicate that I am convinced that it is not only desirable, but perfectly possible, to eliminate the word from our psychological vocabulary, and that this may be done without finding ourselves lacking adequate and expressive words to take its place.

In this connection I may say that I should never think of speaking of 'acute anxiety' (bottom of p. 172) as feeling. I should describe it as an emotional state.

What Professor Angell speaks of as my doctrine was intended to be merely a description of what is really meant by the term 'feeling' as it is employed in careful writing by psychologists whose words we must accept as authoritative and must treat with respect.

Nothing could have surprised me more than the discovery that a psychological district attorney, whom I respect, and whose evidently friendly attitude I appreciate, should find himself called upon, in the interests of psychological morality, to institute an inquiry as to whether I was implicated in an attempted 'looting of the central storehouses of the mind in the interests of this project' (p. 173).

Of any such intention I must plead *not guilty;* and if in the opinion of Professor Angell I have been caught in the aforesaid act

[1] This JOURNAL, Vol. III., No. 7.

[2] *Ibid.*, Vol. III., No. 2.

of psychological burglary, and with the loot in my possession, I desire at once to make full and complete reparation: and I hereby express my desire to turn over to the court (perhaps the readers of this JOURNAL will consent to act in that capacity) all such use of the word 'feeling' as I may have made in the past; giving to the philosophical public all possible assurances that I shall never again employ the word in psychological writing except where I may find it desirable to attempt to explain the meaning other writers intend to convey by its use.

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REVIEWS AND ABSTRACTS OF LITERATURE

The Freedom of Authority; Essays in Apologetics. J. MACBRIDE STERRETT. New York: The Macmillan Co. 1905. Pp. 319.

Of the eight chapters of this book the first four are new, while the last four are reprints of former publications. In Chapter I., 'The Freedom of Authority,' the writer contends for human solidarity *vs.* abstract individualism. "Authority is the right of the species man over its individuals; and conformity is a duty of the individual" (p. 6). The individual is an organic member of his kind, he is part of a system. He is an unknown x until defined by his social relations of heredity and environment. Non-conformity has the value of the negative: it is criticism mediating a higher conformity; it both destroys and fulfills. Freedom is found in the performance of peculiar function. Man is essentially heteronomous, the law of his life has a real basis beyond his own ego. Conformity to the genus is the only way to realize the ideal generic self. The doctrine, however, transcends conventional morality: every form is imperfect and the reformer protests by the authority of the universal character which he apprehends. It also transcends morality, as such, in its advance to the persuasive authority of the divine Father.

Chapter II. reviews the attitude of Sabatier (in his 'Outlines of a Philosophy of Religion' and his 'Religions of Authority and the Religion of the Spirit'), of Harnack (in his 'The Essence of Christianity') and of the Ritschlians as a group. The position of all alike is that of 'immediacy, pectoralism, subjectivity' (p. 67). Negatively, they believe in a Christianity that is non-miraculous, non-Christocentric, non-creedal, non-ecclesiastical, non-cult, and whose Deity is non-knowable (p. 75). Their religion is based on judgments of value rather than of existence; it is rooted in the human rather than the divine. While condemning all religious authority as destructive of the spirit of religion, they yet 'accept modern thought as authoritative.'

They regard the evolution of Christianity as its degeneration and would return to its primitive form. They deny the religious value of the environment (Greek, Roman and Teutonic culture) in its influence

on the religious germ. But 'the crab-cry—back to the beginning of anything that is in a process of development—is irrational, . . . pathological and pessimistic' (pp. 82–83). In this case it means back to the simple unmediated feeling of mysticism.

Sabatier's psychology of religion can give it no rational justification. The Christian philosophy of history is the doctrine of the incarnation of the immanent Logos, the living Christ, as the spirit eternally informing the earthly church. There is neither soul without body nor body without soul, and the body has a spatial-temporal existence, a history. The test of Christianity is this: "How much reason in it, how much reality? Not how much abstract reason of the 18th or the 20th century, but how much of the absolute reason does it embody, incarnate, manifest?" (p. 101).

Chapter III. discussess Loisy's views ('L'Evangile et L'Eglisé'; 'Autour d'un Petit Livre'). Like Sabatier, Loisy writes in defense of Christianity, feeling the need of harmonizing religion with modern culture. He is also a Kantian agnostic, a fideist. But as a liberal Catholic he defends religious authority, and views the history of Christianity as its progressive development.

He regards the Gospel story as largely faith's idealization of the historic Jesus, and a legitimate one. There is, he holds, no historic evidence of the miracles as facts. The historic Jesus founded no church and instituted no sacraments. But a pagan origin of many Christian rites is nothing to their discredit. In Loisy one sometimes finds 'two disconnected developments with no organic relation between them' (p. 118). There is the historical development of the church as the body of religion and the super-historical development of faith as its soul,—a dualism of fact and meaning; but each of these is social in its nature. Again, it is even a question whether his view, like Harnack's, does not assimilate to that of Feuerbach, for whom religion is the self-deification of humanity and 'the gods are wish-beings' (p. 120). For Christ is sometimes exhibited as nothing but the objectification of the community's faith. But his ultimate meaning is probably that of the immanence of the divine spirit in the church; though it is faith and not knowledge that affirms, Christ lives and is real.

Dr. Sterrett maintains that religion is not called 'to abdicate its specific work at the bidding of the scientific culture of any age' (p. 151). If her teachings involve antiquated scientific conceptions, these should be purged away; but not too quickly, for 'ecclesiasticism is ultra-conservative,' even to a fault, and its function in society is revealed by its nature. "The religious interpretation of experience given by any religion of authority, pagan or Christian, is more concretely true than that given by any agnostic form of modern culture" (p. 154). "At least . . . all interpretations of experience—scientific, ethical and religious—are on a par as to validity though not concreteness" (p. 193).

Chapter IV. discusses the historical method, which is regarded as either scientific or philosophic. The former shows the influence of positivism,

it lays too great stress on external circumstance to the neglect of inner tendency (cf. Buckle, Spencer, Taine). If the mechanical theory does not purport to be metaphysics, if it adopts positivism merely as method, if it treats its concepts of matter and force not as real entities but as economic descriptions of phenomenal experience (cf. Mach, Pearson), it has a pragmatic sanction and it comes into no conflict with the religious attitude. But it must remember its limitations. Philosophy as an attempted comprehension of the whole of experience as a system must insist on the subjective or mental factor as important; 'nothing external exists except *plus me*' (p. 174), and this *plus me* factor can not be evolved from the external world.

Mechanical evolution is invalid as an *ultimate* interpretation, for organic development implies *qualitative* change, progress and teleology. The mechanical explanation involves the infinite regress. In referring changes to the mere addition of external environments, it gets only the series *x, xy, xyz,* but discovers no ground, no sufficient reason of development. "The ground is the concrete unity of identity and difference."

The philosophical form of the historical method is teleological. "For anything to transcend its present sensuous form, there must be a factor that is *spatially and temporally unreal,* immanent within it" (p. 198). The ideal of the best is inexplicable by the mere past or present. Philosophy must rise from the relativity of the empirical view to the category of the self-related. The God-principle alone can logically banish pessimism and validate the worth of the finite. The individual who can not realize his identity with the world-principle is without ground for hope.

The remaining chapters treat of 'Ecclesiastical Impedimenta,' 'The Ethics of Creed Conformity,' 'The Ground of Certitude in Religion' and 'The Ultimate Ground of Authority.' "The historical method is the category of rationality in the humanities to-day . . . with its conception of reason expanding and developing under the stimulus of subjective needs and changing environments" (pp. 236–237). "Past forms of creed and cult are estimated by their own contemporary situations, problems and solutions" (p. 238). "The personality of the Christ is the ultimate touchstone by which we must estimate all creeds" (p. 241). They have worth so far as they reveal him who is greater than any creed. This revelation is social, organic, historic, rather than individual. Creedal conformity is thus subscription to the verdict of history. The ideal is no literal conformity to an inflexible creed which would prevent growth, but the Nicene Creed, on account of its universality and its historic vindication, deserves to be taken as an 'ultimate statement of doctrine' (p. 247).

There are two bases of certitude: authority and reason, the organic social process and the individual person. Religion is 'the reciprocal relation or communion of God and man' (p. 256); its two sides are revelation and faith, which can not be abstracted from each other. Religion passes through three psychological forms: (1) feeling, (2) knowing, (3) willing. (1) The unreasoned certitude of feeling is no measure of its

worth. (2) Here religion takes first the form of imagination, then dogma (a mixture of reason and authority), then criticism and, finally, positive synthetic comprehension. Mere negative criticism, 'thought abstracted from action and institution,' is of the devil. The real ground of criticism is faith's apprehension of a deeper truth. Many conceptions are now really problematic, and conformity to true authority will treat them as open questions and attempt their solution; *e. g.*, the nature of the Bible. The precise content of authoritative truth changes with the age. One authority may transcend another. The rationality of each is apprehended 'after the experience of having our best self educed by the process' (p. 287). Rationality implies unity with self, with society and with God. 'The real is the rational' though it contradict individual reason. Yet the actual at any time is not to be identified with the rational. Historical perspective and a social check on individual reason are demanded.

Our space permits only a brief comment on this interesting book. First, it exhibits no single standard by which religious validity may be tested. As shown above, several factors figure jointly. Are they all indeed capable of unification in the category of the absolute? and would this be a working criterion?

The writer reiterates the invalidity of the abstract use of reason. Yet the historical method to which he appeals goes far to justify the unhistorical rationalism dominant from the Renaissance to the 18th century, when thought was using the best method then at its command to free European society from the outgrown authority of the middle ages. Abstract reason is able to isolate its problems and to reach a clearer definition of concepts and their relations,—needs that metaphysics must always feel. To be sure, a total neglect of content and context, analysis without synthesis, is illogical in that it forgets the bearing of its abstractions on the very *purpose* that gave them birth, and this is just what every absolutist as such is in danger of doing.

Our author is by intent equally opposed to a mere faith philosophy. The dualism of faith and reason is to be overcome in concrete knowledge in which each are factors. "Human reason to date is the organic sum total of the esthetic, ethical, religious, scientific and philosophical manifestations of the human spirit" (p. 221). The reader's query is whether the dialectic between faith and reason is put to rest in the author's attitude or whether this vibrates between a living mediated faith and an ontological absolutism which is abstract because it can not, in the nature of the case, honor the human needs which are its source.

Many passages (pp. 105, 241, 287) show the pragmatic phase of the author's thought, without which a philosophy of religion would be impossible. He appears, however, to lean both toward pragmatism and toward absolutism; and does not this mean a rejection of each in turn? In an important note in the appendix, too narrow a concept of the practical leads to a misapprehension of pragmatism; and it is condemned because it maintains that there is 'no absolute system of truth independent of the

needs of men,' *i. e.*, because of its opposition to the abstract reason! One would fain have a system of knowledge that is instrumental in human experience *and* one that is above all vulgar (and sacred) use; but *can* one have both?

The doubt may then be expressed whether Dr. Sterrett's metaphysical assumptions are necessary and sufficient to validate science, epistemology and the other divisions of philosophy, and the arts of life, whether, indeed, they may not be found, when more closely scrutinized, to be in conflict with the genuine motives and meanings of life. One would hardly look for a clear-cut technical statement of a writer's epistemological position in a book of this purpose. But we may venture to doubt whether the ground of certitude there developed could be deemed adequate save on pragmatic assumptions; but if these are admitted, the statement of that ground would of necessity suffer some alteration.

If the book offers the technical philosopher little material and few view-points that are new, yet here much that is not new receives virile, suggestive, stimulating treatment. Its logic is robust, but to a comprehensive survey it does not always appear discriminating and convincing. The author explains, however, in his preface, that his book was 'written in a heat' and that it is both 'semi-technical' and 'semi-popular.'

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Le Darwinisme n'est pas l'Evolutionnisme: RENÉ BERTHELOT. *Bulletin de la Société française de Philosophie,* August, 1905. (Séance of April 6, 1905.—Discussion by MM. Giard, Houssay, Lalande, Pécaut and Rauh omitted in review.)

The proposition that Darwinism and the evolution theory are not identical will be accepted as a truism by any one having even a superficial acquaintance with the literature of philosophical biology; and M. Berthelot might well have spared himself the labor of demonstrating that 'one may conceive of forms of the evolution hypothesis which discard in whole or in part the doctrine of Darwinism.'

Evolutionism and *mechanistic evolutionism* are synonymous for the author, who thereby comprehends any 'theory of the origin of species which does not introduce finality, but which explains facts by their relation to past or present facts, never to future facts.'

According to Berthelot's analysis, "Darwinism consists in the combination of four fundamental ideas: (1) the idea of the struggle for life; (2) the idea of natural selection; (3) the idea of accidental individual variation; (4) the idea of small variation, of slow and continuous change." These propositions may all be contested, he says, without compromising the evolution theory. It need not be pointed out by the reviewer that this analysis, while perhaps true of 'Darwinism' in the narrower sense in which the term is often used, does not fairly represent Darwin's own account of the origin of species.

The doctrine of Lamarck is similarly analyzed into several independent theses: "(1) The formation of new species is a consequence of

physicochemical changes produced in the *environment;* (2) there result variations acquired by the organism *during the individual life,* under the influence of external changes and *accumulated by heredity* during many generations; (3) these variations are acquired *in part consciously, in part unconsciously*—consciously in the higher animals, unconsciously in all other living beings. It follows from this that for Lamarck specific variation is collective from its origin, while for Darwin it is primarily individual. And it results that for Lamarck as well as for Darwin specific variation is not abrupt, but gradual."

The idea of 'accidental individual variation' is regarded by the author as a grave defect in the Darwinian theory, and he asks whether 'the changes which are produced in the physicochemical environment, acting at once in the same way on many individuals,' may not 'produce analogous modifications simultaneously among these diverse individuals.'

Many misinterpretations of 'Darwinism' would doubtless be avoided by a timely reference to Darwin's own writings; and in this case it will be instructive to cite, by way of comparison, a few extracts from the 'Origin of Species.' After stating that at first he 'did not appreciate how rarely single variations, whether slight or strongly marked, could be perpetuated,' Darwin proceeds to say: "It should not . . . be overlooked that certain rather strongly marked variations, which no one would rank as mere individual differences, frequently recur owing to similar organization being similarly acted on—of which fact numerous instances could be given with our domestic productions. . . . There can also be little doubt that the tendency to vary in the same manner has often been so strong that all the individuals of the same species have been similarly modified without the aid of any form of selection. Or only a third, fifth or tenth part of the individuals may have been thus affected. . . . In cases of this kind, if the variation were of a beneficial nature, the original form would soon be supplanted by the modified form, through the survival of the fittest."[1] Here both the agency of the *environment* in calling forth variations, and the *collective* character of these (in Berthelot's sense) are distinctly affirmed.

To the principle of 'natura non facit saltum,' which undoubtedly dominated Darwin's ideas of evolution, the author devotes considerable attention. The relevancy of his allusions to the work of de Vries will be readily admitted, for most biologists will probably agree that Darwin greatly underestimated the importance of discontinuous variation.

"The advances of geology," likewise, "have disappointed the hope which the Darwinians founded on them, and seem hard to reconcile with the thesis of small continuous variations." On the contrary, the 'fixity and discontinuity of geological faunas and floras' are supported by recent investigations.

The discontinuity of chemical changes is regarded as furnishing an instructive parallel, for chemical, as opposed to physical, interpretations of vital phenomena are now most in favor. "It is not improbable that

[1] 'Origin of Species,' 6th ed., pp. 112, 113.

what originates a new species resembles rather the synthesis of water or the explosion of a cartridge of dynamite than the progressive heating of a bar of iron." A species exists in a state of stable equilibrium, which can be thrown abruptly into a new state of equilibrium, but not altered gradually. Such metaphors are of course abundant in mutationist literature.

Darwin's bias in favor of the continuity principle is attributed by Berthelot to his historical setting, more immediately to the influence of Lyell. It was one of the fundamental scientific dogmas of his day. "This belief in universal continuity appears to have a double origin: mathematical on the one hand—or, more exactly, physicogeometrical—on the other hand, social." As regards the latter, 'the instincts and prejudices of the triumphant bourgeoisie' gave support to the theory of gradual change as opposed to abrupt or revolutionary change.

After having effected the dissociation of the principal evolution hypotheses of the day, the author proceeds to recombine certain of the elements thus obtained by a twofold act of synthesis. There result two new hypotheses which Berthelot offers under the paradoxical designations, 'Lamarckian Weissmannism' and 'Evolutionistic Cuvierism.'

As regards the first of these he says: "One may hold at the same time, on the one hand, that specific variations are abrupt and congenital; on the other, that these variations are due to changes of the environment, and in consequence that they are from their origin collective, common to many organisms placed in the same environment. For Weissmann all specific variations are congenital, but they are small, purely individual variations, which selection accumulates little by little, and the influence of the environment plays no part in their appearance."

The theories of Weissmann have undergone so many changes in the hands of their author, that one who is not primarily a biologist may perhaps be pardoned for not having followed them through all of their transformations. It is worth while to point out, however, that in his later writings Weissmann distinctly recognizes the influence of *environment* in evoking changes in the germ plasm, and the *cumulative* and *collective* character of the resulting variations. For example, he tells us that the immense number of adaptations of an organism can not be attributed to '*rare, fortuitous variations, occurring only once.* The *necessary variations* from which transformations arise by means of selection *must in all cases be exhibited over and over again by many individuals.*'[2] These variations, we are further told, 'must be due to the direct effect of external influences on the biophors and determinants.'[3] He even goes so far as to concede that 'climatic and other external influences are capable of producing permanent variations in a species,' independently of selection; though he remains convinced that 'the countless majority of modifications' result from selection.[4] "'*The accumulative action of changed conditions of life,*' suggested by Darwin, is conse-

[2] 'Germ Plasm,' p. 432.
[3] *Op. cit.*, p. 415.
[4] *Op. cit.*, p. 422.

quently theoretically supported to a certain extent by the theory of the continuity of the germ plasm."[5] It is far from the purpose of the reviewer to defend the system of Weissmann, in either its earlier or its later form, but fairness as well as historical accuracy demands this correction.

The second of Berthelot's twin hypotheses rejects 'the belief of Cuvier in providential intervention, in a creative action of the Divinity,' while preserving 'the idea that the origin of species has occurred in the greater number of cases, at least with higher species, in a sudden and collective manner, since it appears difficult otherwise to explain the paleontological facts in which Cuvier found support, and which are not less true to-day than they were eighty years ago.'

We are not told how great a modification Berthelot thinks may be fairly attributed to a single act of mutation; and we are left to wonder whether he would regard any of the larger gaps in the paleontological record as due to the non-occurrence of transitional forms, past or present. Some of the references to geology and to Cuvier would seem to imply this.

Finally, by a supreme act of synthesis, the author proposes to combine the two hypotheses just developed. By this means, 'we should obtain a view of the ensemble of biological evolution which would be neither that of Darwin nor that of Lamarck, since we should abandon the postulate of continuity, which is common to both of them, and since we should attribute the origin of new species neither to selection nor to the inheritance of acquired variations, whatever may be the influence of these two factors to call forth diverse changes, but of less amplitude, among living beings.'

To the reviewer these hypotheses of Berthelot's appear to be logical, rather than biological, creations. One looks through the paper in vain for new facts, and, indeed, for any really original interpretations. This is far from saying, however, that it is entirely lacking in interest or in suggestiveness.

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Les mathématiques et la logique. H. POINCARÉ. *Revue de métaphysique et de morale,* November, 1905. Pp. 815–835.

Sur la relation des mathématiques à la logistique, avec une note de M. Whitehead. B. RUSSELL. *Revue de métaphysique et de morale,* November, 1905. Pp. 906–917.

M. Poincaré, discussing M. Couturat's denial of any appeal to intuition in mathematics,[1] puts the issue with French clearness. Admit that from beginning to end the deductions of mathematics are interrupted by no intuitions: what is the source and meaning of the starting-points, yes, of the whole process? Whenever a new starting-point, a new 'arbitrary convention,' is adopted, why is *it* preferred to others? These conventions would need an accompanying axiom asserting their existence.

[5] *Op. cit.,* p. 437.

[1] *Revue de métaphysique et de morale,* 1905, *seriatim.*

This existence, of course, is not psychological nor physical, but logical; *i. e.,* such that the conventions may be so stated that no contradictions issue from them or any of their consequences (which consequences are in mathematics infinitely numerous). Now until you have proved the validity of complete induction, you can not argue with respect to an infinite series. But to prove complete induction you must show that none of an infinity of cases would offer in itself a contradiction. This you can not do without complete induction as a basis. Thus mathematics has no means of proving the logical existence of its concepts, except by an appeal to the intuition. Again, what guarantee have we that our definitions apply to the entity defined, *e. g.,* that the definition of number applies to those entities we call numbers? Surely it needs an intuition to perceive the identity of the two. Again, the definitions of pasigraphy do but give over again what we intuit directly, *e. g.,* the definition of one as the class of two members which are identical—for what is *two* unless we first know *one?*

Mr. Russell's indemonstrable axioms, not being shown by him to be incapable of self-contradiction, are again intuitions. M. Couturat indeed admits that we need a special axiom in each case to assert their existence. This amounts to admitting that we intuit them. We think M. Poincaré might say that even the deductions themselves have force to us because we intuitively perceive their value. Who can prove that proof is binding? Is it not an immediately felt certainty? In short, as, if I remember correctly, Professor Royce once remarked, intuition there is in plenty in mathematics, but the real issue is, is it the *kind* of intuition we have in space-perception and daily experience with the outer world? We do not see that M. Poincaré has here raised a point which Mr. Russell need deny. What the former calls an intuition the latter calls an indemonstrable proposition. But so long as M. Poincaré and (as quoted in the paper named above) M. Boutroux define intuition in a purely logical sense, not in an experiential sense, we do not see that there is an important difference between the two schools, and we must class both over against the school of radical empiricism which believes that existence, concept, truth, proposition, can be defined in psychological or physical terms. This question, we regret to say, the devotees of logistic do not explicitly examine. It is a fault common to the whole school, that they start from certain philosophic presuppositions which admit of much controversy, and then think that their methods and results must have fundamental philosophic value. The same criticism, we think, pertains to Mr. Russell's reply to M. P. Boutroux. Mr. Russell shows that correspondence is not an ultimate indefinable, that there is no gap in the reasoning which leads to it, needing to be filled by an appeal to intuition. And yet M. Boutroux, who defines intuition as 'not the result of sense-experience, nor of combination of or deduction from anterior knowledge'[2] could reply, we think, in the spirit of M. Poincaré, that it is a guiding force which leads us to combine or deduce from anterior knowledge, or even to set up new indefinables. We agree with Mr. Russell in finding

[2] *Revue de métaphysique et de morale,* XIII., p. 624.

this definition hard to understand, for we do not see that there is anything in it which could not be expressed in logistic terms. Indeed, Mr. Russell admits that if by intuition you mean the discovery of a new indefinable, you are consistent enough. M. Boutroux also accuses Mr. Russell of not getting all the detailed results of mathematics. The latter replies (justly, we think) that when you have defined a class like number intensionally, you have essentially deduced all the particular numbers: the general rule being given, that is enough. He accuses M. Boutroux in turn of confusing intension with extension. If the extension is not completely deduced, the intension may be: the latter alone is the subject-matter of mathematics. Again, M. Boutroux is said to confuse the act of discovery with the thing discovered. The thing discovered may be an object of intuition even while it is discovered by means of logistic processes. Of course; but is intuition after all essentially different from logistic proof? It seems unimportant, how we are led to discover a truth; the important question is, do the truths discovered, when reduced to lowest terms, show mutual independence, or are they logically dependent upon a small number of concepts and axioms? It is this connectedness or disconnectedness that we want to discover, and if logistic has shown that the complex 'subject-matter of exact thought' stands upon a very few simple truths, it has done a great thing. The real problems for discussion are, we think, not the issue between logical intuition and logical deduction, but the philosophical presuppositions of logistic, and the correctness of the definitions and deductions it contains.

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JOURNALS AND NEW BOOKS

ZEITSCHRIFT FÜR PSYCHOLOGIE UND PHYSIOLOGIE DER SINNESORGANE. November, 1905, Bd. 40, Heft 4. *Ueber das Verstehen von Worten und Sätzen* (pp. 225–251): CLIFTON O. TAYLOR. – By observing the introspection of a number of subjects in the comprehension of various texts and in the solution of problems, the following conclusions are reached: The comprehension of sentences of concrete content may be aided by the development of congruent imagery. These auxiliary images become less frequent as the matters treated of in the text are more familiar. The comprehension of sentences of abstract content is not facilitated by such imagery, but rather hindered. Pauses not occupied by special experiences appear necessary to comprehension. The influence of context may aid in comprehension without the appearance in consciousness of any special contextual experience. *Die Orientierung der Brieftauben* (pp. 252–279): G. H. SCHNEIDER. – The problem to which this study was limited was whether the carrier-pigeon possesses an innate sense of direction, or whether it is guided by the eye, and in this case what factors in topography and the like are significant. The

method was to release pigeons of varying ages at different distances, and under varying topographic conditions, and to note the time and nature of the flight homeward. The conclusion is that there is no innate sense of direction. Young pigeons find their way home even at short distances with great difficulty, and often require days to return, and in many cases they never do return. Groups of houses and valleys seem to be the chief guides. The nature of the flight varies widely. If the home environment is clearly seen, the flight is in a straight line. When the home environment can not be seen, and the direction is unknown, the pigeon flies about for some time in a circle. When two villages similar in appearance to the home environment are seen, the flight alternates for a long time back and forth. This study was made by Dr. Schneider in 1886 at the suggestion of the Prussian Ministry of War. *Literaturbericht.*

REVISTA FILOSOFICA. November–December, 1905. *La Finalità della vita* (pp. 589–621): B. VARISCO. – A defense of final causes in biology and a criticism of Reinke's 'Philosophie der Botanik.' In opposition to Reinke, Varisco holds that a living organism has something—life—not found in inorganic nature. In physiology neither causality nor finality can be ignored. To overlook finality is to overlook the organism. Indeed, in the case of organisms finality is much more evident and certain than causality. *La Sociologia e l'insegnamento Secondario e superiore* (pp. 622–648): A. PAGANO. – The majority of those Italians who guide the political affairs of their country receive their education under one of the faculties of law in an Italian university. Their previous education has been chiefly literary, their university training is chiefly 'legal.' In both they are provided with traditional conceptions for deductive application to present conditions which the student has not been properly fitted to understand. Literary training should not be diminished, but it should be so selected and combined with the study of history broadly conceived, that the student becomes acquainted with the geneses and tendencies of the social forces with which the lawmaker has to reckon. *Sul Nietzsche* (pp. 649–668): A. FRANZONI. – A review of recent works on *Nietzsche. Rassegna Bibliografica* (pp. 669–717). *Necrologio:* Romualdo Bobba; Vincenzo Lilla.

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NOTES AND NEWS

A. H. BUCHERER, writing from the University of Bonn to the *Athenæum* (of March 24), makes the following observations in the course of his rather technical communication. "It is the fate of all important physical theories that, after inaugurating a period of brilliant discoveries, they are taken to task by an array of new experimental facts, accruing from the continually refining process of our methods of observation. The Maxwellian theory has not been exempt from this fate. It is the absence of the effects of the annual motion of the earth through the ether on terrestrial optics, and in general on terrestrial electromagnetic phenomena, that causes so much difficulty, and it is to-day the foremost aim of all theorists working in the field of electromagnetism to find a plausible hypothesis accounting for this absence, which has been established to an astounding degree of accuracy. To speak strictly, the Maxwellian theory in its original form can not offer any explanation, and we have to turn to its natural outgrowth, the electronic theory. It can be shown that, unless the structure of matter undergoes a certain change by moving through the ether, the negative results of all the experiments undertaken with the view of discovering the influnce mentioned would be incomprehensible. Now, whenever we appeal to the structure of matter for an explanation of electromagnetic phenomena, we really appeal to the electrons of which we consider matter to consist. . . . An electron at rest is a small charged sphere of a diameter of about one-ten-billionth part of a centimeter, the electric charge residing on the surface or being distributed in the interior. The electric force of this electron is easily expressed by applying the ordinary laws of electrostatics. If we impart a uniform motion to the electron we must assume the laws of flowing electricity. For the motion of a charge constitutes an electric current, and to start this with its magnetic field a certain expenditure of energy is required. We can view this electromagnetic energy in the light of the ordinary kinetic energy of masses, and ascribe it to some ideal mass of the electron, which is then termed its electromagnetic mass. There is this

difference, however, that if compared with the masses we are familiar with in mechanics, it varies with the velocity, becoming infinite when the velocity of light is reached. This difference may, nevertheless, be only apparent, since we have no experience with ordinary masses moving with velocities sufficiently great to exhibit their dependence on velocity. And there is yet another distinction. If we accelerate a moving electron in its line of motion, its mass behaves differently from that which is called into play when we impart to it an acceleration perpendicular to the direction of its velocity. So we are forced to distinguish between a longitudinal and a transverse mass, besides the mass mentioned above in connection with the kinetic energy of the electron. For slow motion these three masses assume identical values. The manner in which these masses increase with velocity depends on the shape of the electron. . . . He (Kauffman) established beyond any doubt *that the Lorentz electron described above does not satisfy the experimental data.* The Lorentz deformation being claimed to be the only one to account for the absence of any influence of the earth's motion on terrestrial optics, it would appear that the Maxwellian theory, which forms the basis of Lorentz's analysis, stands condemned. The writer does not quite share this opinion. Matter is not so simply constituted that we should venture to make absolutely final statements as to the effects of a rectilinear motion upon its structure; nor is the Maxwellian theory so inelastic as to break down at once under the weight of these brilliant experiments of Kauffmann."

It is a pleasure to note the appearance of the *Journal of Abnormal Psychology,* of which the first number has been issued. It is to be published bi-monthly from April 1, 1906, and the editorial management will be under the direction of Dr. Morton Prince with the cooperation of Professor Hugo Münsterberg, Dr. Boris Sidis, Dr. Charles L. Dana, Dr. J. Putnam, Dr. August Hoch and Dr. Adolf Meyer. The prospectus makes the following statement: "The *Journal* is meant to subserve the interests of both medical science and psychology. It is primarily intended for the publication of articles embodying clinical and laboratory researches in abnormal mental phenomena. At present reports of observations in this field are scattered throughout the medical and psychological literature of the world, and not only escape attention, but it is difficult to find them when wanted. Until now there has been no such periodical printed in English. It is intended that the *Journal,* though printed in English, shall be international in character. Articles may be printed in French or German if expressly requested by the author." The first number contains articles by Dr. Pierre Janet, Professor W. von Bechterew, of St. Petersburg, Dr. James J. Putnam and Dr. Morton Prince. Editorial communications should be addressed to Dr. Morton Prince, 458 Beacon St., Boston, and subscriptions (three dollars a year) and all business correspondence should be sent to the Old Corner Bookstore, 27 Bromfield St., Boston, Mass. The publishers deserve decided credit for the material qualities of the *Journal* and its general appearance.

THE *Harvard University Gazette* announces the appointment of Professor Eugen Kühnemann, of Bonn University, as Germany's representative at Harvard for 1906–7, the second year of the international interchange now regularly established between Harvard University and the German government. Harvard's representative for next year has not yet been announced. During the current year Germany was represented at Harvard by Professor Wilhelm Ostwald, of Leipzig; and Professor Francis G. Peabody was Harvard's representative at the University of Berlin. Both of these professors went into residence as members of the teaching staff for one semester, giving a stated number of exercises every week. The success of the first year's experiment as shown by the regular attendance of students and their sustained interest is a favorable indication of the benefits to be derived from the interchange in the future. The interchange is carried on under an academic protocol or treaty between Harvard University on the one hand and the German government on the other, which is to continue in force until withdrawn by mutual consent. Professor Kühnemann's courses at Harvard University next winter will probably deal chiefly with the classic epoch of German literature in the eighteenth century and with German literature and thought of the present day.

THE *Psychological Bulletin* reports that "a special alcove has been set aside in the philosophical library of the Johns Hopkins University, to be called the Royce Collection of Philosophical Americana. The alcove is endowed by a fund donated by Professor Josiah Royce, of Harvard University. It will comprise especially works, editions, manuscripts, etc., illustrating the sources and progress of philosophy in America."

THE Western Philosophical Association met conjointly with the North-Central Section of the American Psychological Association, on Friday, April 13, at the University of Wisconsin. Abstracts of the papers read will be published in a later number of the JOURNAL.

DR. E. C. MOORE, professor of education at the University of California, has been appointed dean of the coming session of the University of California Summer School. After the summer session Dr. Moore will go to Los Angeles to assume the duties of superintendent of schools of that city.

PROFESSOR ROBERT FLINT has received the appointment of Gifford lecturer at Edinburgh for two years, and Professor James Wood has been appointed Gifford lecturer for three years at St. Andrews.

DR. HANS DREISCH, of Heidelberg, has been appointed Gifford lecturer in Aberdeen University for 1907–9.

DR. GUSTAVE LE BON has been elected foreign associate of the Académie Royale, of Belgium.

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Volume III. No. 4. February 15, 1906.

Is Absolute Idealism Solipsistic? F. C. S. SCHILLER.
The Interpretation of a System from the Point of View of Developmental Psychology. EDWIN TAUSCH.
Discussion: A Reply to Dr. Miner. J. W. BAIRD.
Reviews and Abstracts of Literature. Journals and New Books. Notes and News.

Volume III. No. 5. March 1, 1906.

The Nature of Consistency. G. A. TAWNEY.
Feeling as the Object of Thought. KATE GORDON.
Discussion: The Meaning of Identity, Similarity and Nonentity: A Criticism of Mr. Russell's Logical Puzzles. W. P. MONTAGUE.
Reviews and Abstracts of Literature. Journals and New Books. Notes and News.

Volume III. No. 6. March 15, 1906.

The Moral Individual. J. DASHIELL STOOPS.
On 'Feeling.' GEORGE M. DUNCAN.
Societies: The Fourteenth Annual Meeting of the American Psychological Association. VIVIAN A. C. HENMON.
Reviews and Abstracts of Literature. Journals and New Books. Notes and News.

Volume III. No. 7. March 29, 1906.

Recent Discussion of Feeling. JAMES ROWLAND ANGELL.
Cognitive Thought and Immediate Experience. J. A. LEIGHTON.
Discussion: The Quarrel about Transcendency. W. H. SHELDON.
Reviews and Abstracts of Literature. Journals and New Books. Notes and News.

Volume III. No. 8. April 12, 1906.

The Ground of the Validity of Knowledge. EDWARD G. SPAULDING.
Discussion: Professor Calkins's Mediation. MARY S. CASE.
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